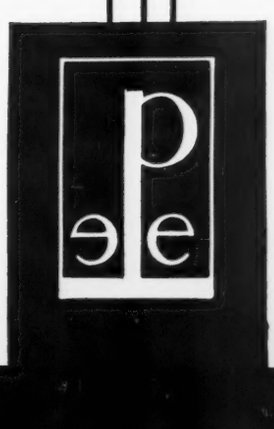
PRINTING EQUIPMENT ENGINEER



Edited for those concerned with the use and care of Printing Equipment

JUNE
1931

MEDIEVAL
AN INTERTYPE FACE
BODONI MODERN
INTERTYPE VOGUE
A MODERN FACE MADE IN LIGHT AND BOLD FOR USE ON ANY LINE COMPOSING MACHINE
THE INTERTYPE GARAMOND FAMILY
INTERTYPE IDEAL NEWS FACE
SHOWN IN COMBINATION WITH SOME OF THE MANY
INTERTYPE HEADLETTER FACES

INTERTYPE FACES

ARE THE FACES THAT YOUR CUSTOMERS WANT

• • • Intertype believes that as long as creators of printed advertising strive for unusual and interesting effects there will be a demand for new faces that are more than just readable.

• • • Intertype believes that there are many excellent faces now in existence that should be put on line composing machine matrices. And Intertype does not believe that all worthwhile faces have been designed.

• • • Intertype believes that new faces are a means of producing added business for progressive printers and publishers. There are few words that have greater sales appeal than the magic word "New."

• • • Intertype believes that the changing thought in the arts related to printing brings demand for type faces. The art and copy in printed advertising today is a seven-league step ahead of that of even a decade ago. And a decade from now the factors entering into printed advertising will give our present efforts the just title of "Old Fashioned."

• • • Intertype will continue to co-operate with the progressive element among the designers of printed advertising as well as the most progressive designers of type faces, and as new types are needed for the new conditions, the new art, and the new effects, Intertype will strive to supply the new faces — on the Famous Intertype Wide Tooth Matrices for economical composition on line composing machines.

INTERTYPE MODERN WIDE TOOTH MATRICES COST NO MORE, LAST LONG AND RUN ON OTHER LINE COMPOSING MACHINES

Specimen books of any Intertype face will be sent free on request

INTERTYPE CORPORATION

360 Furman Street, Brooklyn, N. Y.; Chicago, 130 North Franklin Street; New Orleans, 816 Howard Avenue; San Francisco, 152 Fremont Street; Los Angeles, 1220 South Maple Avenue; Boston, 80 Federal Street; Canada, Toronto Type Foundry Co. Ltd., Toronto; London, and Berlin
Distributors Throughout the World

A32. Set in Intertype Vogue and Vogue Bold

PRINTING EQUIPMENT ENGINEER

TRADE MARK REG. U. S. PAT. OFFICE ESTABLISHED 1910

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Let others also read The Engineer

After you have read this copy, pass this magazine along to the other men in your organization. They will undoubtedly get helpful ideas from its pages.

Check in left column after reading. Note articles of interest.

☐ *Composing Room Superintendent*

☐ *Superintendent Press Room*

☐ *Chief Composing Room Machinist*

☐ *Superintendent Stereotype Foundry*

☐ *Monotype Department*

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☐ *Bindery Foreman*

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BLACK & WHITE

Contrast Matrix

"Contrast Provides VISIBILITY"

ANOTHER MEMBER OF THE CRAFT SPEAKS:

Photo by Staff Photographer Blade and Times

PHIL C. VOELKER
Chief Machinist
Toledo Blade and Times

February 15, 1931.

Mr. R. J. Barrett, President,
Matrix Contrast Corporation,
33 West 42nd Street,
New York City.

Dear Mr. Barrett:

The *Times* operators like the contrasted matrix very much just as the *Blade* operators do and have enjoyed for almost four years.

The contrasted matrix has so many advantages over the non-contrasted matrix that I sincerely believe any office using black and white contrast matrix will always be a user and booster for the contrasted matrix.

Very truly yours,

PHIL C. VOELKER,
Chief Machinist,
Blade and *Times*, Toledo, Ohio.

ASK US FOR FURTHER PARTICULARS

MATRIX CONTRAST CORPORATION

(Sole Licensees of the Percy L. Hill Black and White Patents No. 1466437, held valid by U. S. District Court, Eastern District of New York. Infringers will be vigorously prosecuted.)

33 West 42nd Street, New York

PRINTING
EQUIPMENT
ENGINEER
June, 1931

A Metal Pre-Melting and Elevating System

By CLARENCE A. STIMPSON*

Clarence A. Stimpson, Electrical Engineer, and Developer of Mechanisms for Use in the Printing Industry.

THE Speed System of Metal Distribution is a new method of transferring molten stereotype metal, instead of plates, from the press or reel room to the stereotype foundry by automatic means. The stereotype casting pots, to which the molten metal is delivered, may be on the same floor level with the press-rooms or ten floors above it—the distance or elevation making no difference in the cycle of operation.

This system is fully automatic, providing sufficient reserve and storage capacity and maintaining a set level of molten metal in the casting pots of the stereotype foundry. Briefly, this is accomplished through the use of a storage pot, a pump and a pipe line feed to the casting pots.

WORD PICTURE OF SYSTEM

In order to clearly understand the operation of this system, let us draw a word picture, describing the movement of a dead stereotype plate from the time it leaves the press cylinder.

The plates may either be dropped on the conventional type floor conveyor on the press room level or manually passed to the reel room as the existing condition may be. In either case the plate is automatically dropped into a melting pot in the reel room where it is reduced to a molten condition. As the pot in the reel room is both a melting and storage pot, the plate which is now approximately fifty pounds of molten stereotype metal remains here until the casting pot in the foundry demands more metal. The demand for more metal being an electric impulse, instantly starts in operation a pump set in the molten metal of the reel room pot and within the next minute one thousand pounds (the equal of approximately 20 plates) have been added to the casting pot—ready for use at the required casting temperature.

OUTLINE OF EQUIPMENT

The return of "dead" metal (plates) as outlined is basically a liquid conveyor system requiring the following equipment:

(1) *Reel room pot* for the purpose of pre-melting the metal and to serve as a storage reservoir from which the metal is drawn by means of
(2) *A pump* which is situated within the metal pot. The pump elevates the molten metal one or more stories through a
(3) *Pipe line feed* and delivers it directly into the stereotype casting pot, the entire mechanism being actuated by
(4) *Automatic electric control.*

Describing the equipment as outlined above, we have first the reel room pot. This pot is made from boiler plate, welded and reinforced. The reasons for this are manifold, but principally the pot is so made stronger and can be formed into any shape or size to fit location and capacity. Its manufacturing cost is also less expensive than a good cast malleable iron pot and may be constructed in the locality of use, thus eliminating freight charges.

The pot is provided with an automatic control regulating the set maximum level, preventing overflow.

Has This Ever Occurred To You?

The lay-mind is sometimes startled when a new method or mechanism is developed to accomplish a certain operation by a means other than what is accepted as conventional. Mr. Stimpson explains for our readers a system for automatically pre-melting and conveying stereotype metal in a molten state, in definite amounts as required and of the proper temperature, from the press or reel room to the stereotype casting pot, which may be on the same floor level as the press rooms or at a ten-floor elevation.

*President, Speed Products Company, Cleveland, Ohio.

When electric heat is used, the pump is set high enough to prevent the heating element from being uncovered.

CAPACITY OF THE PUMP

The pump is of a vertical rotary type, directly driven and directly immersed in the pot. This, however, is no ordinary pump. It may be of interest here to point out the fact that average stereotype metal alloy weighs 660 pounds per cubic foot and at 600° Fahrenheit has the same viscosity as water. The pump will handle 1000 pounds per minute against a dynamic head of 60 feet at any temperature from 600° to 750°. Greater heads or lifts are taken care of by simply adding additional stages to the shaft. Bolted brackets hold the pump to the pot and in the event of failure another unit could be replaced within 30 minutes. It is also capable of dropping every ounce of metal in the feed pipe a few seconds after the power is shut off without the use of any valve equipment whatsoever.

CONSTRUCTION OF PIPE LINE

The feed line from the pump to the casting pots is made of special steel with special flanged joints and is so arranged as to be heated, externally and automatically, and is thoroughly insulated. The feed line would not exceed eight inches outside diameter, including insulation. It is necessary that the metal should not be chilled in the pipe line. One heating unit the length of the line will prevent this. Instead of only one heating unit, however, the line is provided with six, each a separate circuit, anyone of which is cut in automatically in the event of failure. If for any reason the power of the whole plant is shut off, the metal in the pipe is instantly returned to the pot by gravity.

Every possible emergency has been carefully considered and guarded against. The automatic control makes this possible, acting even before the mind could grasp the situation.

The pipe line feeding the casting pots is equipped with a special device moving up and down with the level of the pot and equipped with an automatic station, starting or stopping the pump, thereby maintaining the metal level automatically.

An important feature not previously mentioned is that of expansion in the feed line. Expansion will vary according to the length of line used and this is safeguarded by properly directing it. This feed line may be run through any office or in any part of the building with perfect safety and in such a manner as not to destroy any interior decoration effect.

FLEXIBILITY OF SYSTEM

This system is flexible enough to meet the wide range of various newspaper capacities and conditions, yet maintaining all fundamental characteristics and a general low investment cost.

If a coal mine operator could reduce coal to a liquid condition in the mine, and as a liquid transport it to markets for distribution, it would be hard to imagine the necessity for spending hundreds of thousands of dollars for the elaborate equipment in use today.

The huge modern power-generating stations of this country get as close to this as possible by finely powdering the coal and blowing it into the boilers. Unfortunately, stereotype metal weighing 660 pounds to the cubic foot, cannot be easily blown around, but it can be pumped as easily as water.

The marked lack of expensive equipment, the absence of noise and the great speed and safety of this system are distinctly favorable to the publisher, not to mention numerous other advantages which need not be detailed here.

Speed And Its Problems

By WALTER H. OGDEN

WHAT is speed going to do to the manufacturing end of the newspaper industry?

How is the remarkable increase in the speed of the later type press going to react on the industry as a whole? What's going to happen? Presses are now running at speeds unthought of before, and everybody likes it. Even the fellows who operate them are developing a spirit of competition heretofore unknown.

Certainly, difficulties that have never been met before, must be and are being overcome. Plates show a decided tendency to leave the press at high speed and this, together with the fast-operating autoplate machine which does not yet produce the sturdy plate the junior caster makes, proves an unholy alliance which must be somehow overcome. Press manufacturers are meeting this by insisting that their customers use the 45-degree plate bevel instead of the 60-degree bevel, and are also making the locking bands higher and wider. Printing quality has not suffered materially on account of the increased speed, in fact, there are those who maintain the quality improves above 45,000 papers per hour.

The rubber roller has done much to make these speeds possible and it will require still greater efficiency from the roller-maker as well as those who make blankets and other accessories, to say nothing of papers, inks, etc., which enter into the process of manufacture.

Quick changing of paper rolls without lessening the maximum speed is just around the corner and when that has been accomplished the number of presses needed for the present-day tasks will be materially decreased. This is in line with the tendency of the machine age and the development is charged with about as many economic possibilities as mechanical problems.

The introduction of high class color printing (not quick-speed "smearing") will, in the opinion of the writer, be the medium to bring us out of this haze of speed—back to normalcy, if you please, with quality the aim rather than abnormal unit production.

Factors Which Destroy Printing Profits

By W. L. CHURCHILL*

THE printing industry is making a very unsatisfactory showing for its stockholders and owners.

Despite the apparent better position the printing and publishing industry holds over many other industrial groups, its profit showing as a whole is not one to be proud of, especially when the character of its work and its personnel are considered. Here there is a highly technical industry manned by people who have had to devote years to specialized training in order to conduct their work with skill and efficiency. Obviously there is something wrong when one-third of the firms in such an industry employing this exceptional skill and ability report deficits from their operations.

In addition to this distressing and indefensible situation, a large portion of the firms reporting profits have earnings that are insufficient to insure the perpetuation of their businesses. They lack sufficient surplus to invest in modern equipment that will enable them to keep pace with the developments in their industry and with the growth in demand for printing products. If these firms and the losing firms should be placed on an adequate profit-earning basis, manufacturers of printing equipment would no longer be hungry for business to fill their plants.

If it were possible to list the firms in the printing and publishing industry doing their full duty to society by earning adequate profits, the number would be very small. It has been estimated that less than one firm in twenty-five continues to operate upon a sufficiently profitable basis to enable it to remain in business for a period of 30 years without reorganization, refinancing, or some major change involving loss to stockholders and owners.

We are so accustomed to this situation that we give it little thought or concern. We accept it as a matter of course. We look upon it as an inevitable consequence of competition. We even in this enlightened day talk of the "survival of the fittest" and of "price wars."

There is no inherent reason for this condition in the printing or other basic industry. Management has not been trained to think in terms of profit. Effort has been directed toward lowering costs, increasing output, improving quality, and effecting savings. It has generally been assumed that the accountant and salesman could be depended upon to see that efforts resulted in profits.

Profits do not necessarily follow savings. The most perfect plant designed for the most efficient operation and operated with the greatest skill and economy can still fail to earn profits. It is not sufficient to condemn management as the cause for unprofitable operation. Management needs enlightenment on the specific and fundamental factors that destroy or prevent profits.

All of our material progress depends upon profits. Firms with ample profits reinvest a large portion of them in new buildings, equipment, research, and special services, making business for their suppliers and insuring their own growth, development, and perpetuation.

The author will briefly touch upon a few of the profit factors that at present are practically unknown. Take the question of the amount of profit that should be earned. If you are seeking a startling revelation of the ignorance existing in regards to what constitutes proper profit, the author will suggest that you ask various heads of enterprises with which you are connected this simple question: "How much profit should your business earn per year?" Not one business executive in ten will quote a figure sufficient to meet the requirements of business perpetuation.

This statement is based upon experience covering several hundreds of such business questionnaires. The inadequacy of the profit conceptions of these business heads explains the cause for many of the failures to attain profits that are safe.

A second question to ask is: "On what should the profit of each product be based?" Replies received from 125 manufacturers answering this question in combination with the first elicited 42 different bases and rates for profit determination. Not one of these 125 firms, whose businesses averaged over $1,000,000 each, had a correct basis for profit determination although 11 of these firms had a sufficient amount as an objective.

There is one definite basis for correctly determining the amount of profit that should be earned by any enterprise engaged in a profit-making industry. The formula is as complex and yet as definite as determining the horsepower of an engine. It is not dependent alone upon investment, sales volume, number of employees, or any other single factor. It requires a knowledge of values of equipment and facilities, of operations involved, of personnel requirements, and an understanding of the economics of production and distribution.

There are only some 8 or 10 fundamental questions of the nature of the two already mentioned that have to be understood in order that any worthy enterprise may function profitably. When they are all under-

*Economist-Engineer, New York, N. Y. As industrial engineer and consultant Mr. Churchill has served a large number and variety of industries including gold-dredging in the Yukon, land reclamation in California, and during the war specialized on the development of shipbuilding, especially on the Pacific Coast. Since 1920 Mr. Churchill has devoted the major portion of his time to research into the economics of profits. Abstract of a paper delivered at an A. S. M. E. meeting for printing engineers.

stood, "price wars" and "survival of the fittest" become obsolete phrases. There is no destructive price competition, and all worthy firms may survive because all become fit.

Revising prices to accord with the known engineering and economic elements has in many instances converted losses to substantial profits almost overnight. This has been particularly true with plants whose engineering activities had developed a high level of efficiency, yet where profits had continued at subnormal levels or actual deficits were the order of the day.

There are as many cases of unintentional overpricing as there are of underpricing. Overpricing drives away business and abnormal profits with it. Underpricing encourages business, but with resultant losses that go with underpriced efforts.

Determining the correct basis for pricing is an engineering task, but when properly applied insures continuous profits to any reasonably well-managed plant or industry. Under such conditions, super-management brings super-profits, indifferent management brings indifferent profits, but the proportion of enterprises so poorly managed as to make no profits will be very small. The fundamental factors that govern profits are quickly learned and easily understood. Application becomes a matter of simple routine.

The printing industry may be likened to a malarial district where a large portion of the individuals exist in a semi-sick state while a comparative few seem to continue in robust health. We used to think that there was no help for this condition. It was in the air, and we took quinine and all kinds of patent medicines to minimize the effects and with the hope of prevention or cure. When the cause of malaria was discovered and malaria carriers were removed by drainage and similar measures, these districts were converted into healthful communities, in which anyone may now live without fear of this ailment, by simply keeping the community free from the conditions which allowed the mosquito to thrive.

Likewise with industry, remove the fundamental cause of the low state of profit health (ignorance of profit economics), and all may enjoy the full vigor of successful endeavor. Industry needs to have the cause removed rather than administration of periodic doses of quinine.

Any printing establishment can place itself upon a profitable basis if it will indulge in sufficient study and application of sound engineering principles in the conduct of its operations.

Profits mean progress. The greater the profits, the greater and more rapid our progress. There is a difference, however, between profits and plunder. Profits are profits only when all parties to the transaction benefit thereby.

The profitable industries pay the most profitable wages; that is, wages that provide a surplus to the worker over and above his necessities. This condition in turn encourages the best workers to flock to that industry and in turn develops their employing interests to higher profits and their products to greater demand because of their greater value.

These facts are splendidly illustrated in a comparison of the average earnings of workers in the various industrial groups as reported by the United States Department of Commerce for 1927.

The average yearly wages in manufacturing industries, including printing and publishing, were approximately $1300 in 1927. The average of all wage earners in the printing and publishing industry was $1782. Including salaried people (this industry pays nearly 40 per cent of its people by salary), the average earnings of all workers in the printing industry were $1847.

The textile industry, comparable in many ways to printing and publishing, paid an average of $1040 to each worker in 1927. The average profit earned by each worker in the textile industry for stockholders and owners amounted to $115. In the printing and publishing industry the average was $354, or more than three times the per capita profit of textile workers.

You are fortunate in being in an industry that has already displayed leadership in our industrial advancement and in demonstrating that high profits induce high wages and that the combination of both spells low costs that the consumer profits generously by as well.

We read about the wonderful value per dollar in our automobiles produced by another comparatively high-profit and high-wage industry; yet where will we get comparable value for the pennies and nickels spent in the printing industry?

Even with printing's enviable position in relation to other industries, we must not overlook the fact that one out of every three of the printing and publishing firms is losing money. We have a long way to go to put the entire industry upon a profitable basis and still further to bring the industry up to its full measure of profit so that it can continue to progress and add to the sum of our human development.

Chemists Elect Lewis

G. C. Lewis, Technical Director of the Columbian Carbon Company, and Managing Director of The L. Martin Company, manufacturers of the well-known Columbian Inks, has been elected President of the Chemists' Club of New York for a term of two years. He succeeds Dr. L. V. Redman, inventor of Redmanol and Vice-President of the Bakelite Corporation, manufacturers of synthetic resins and lacquers.

The Chemists Club has a membership of over 1700 American and foreign members. Its Club House is located at 50 East 41st Street, with the finest strictly chemical library on this continent. It also gives scholarships annually to deserving students in their chosen profession. It has on its roster the names of some of the most prominent chemists in Europe, as well as this country.

Mr. Lewis has made a special study of carbons, and is the holder of over twenty American and foreign patents for the production of the same.

Matrix Letter Alignment

By Mac Sinclair

Good letter alignment on slugs from line-casting machines depends almost wholly upon the condition of the matrix lugs as well as the condition of the first elevator jaw and the mold alignment grooves. In respect to the former, after a font of matrices has been used long enough to wear the lower lugs, the best plan is to discard the characters showing misalignment and replace them with new ones. This can be done at a reasonable price. Usually the principally used channels (etaoinshrdlucmfwypvbgk) and the

eettaaooiinnsshhrrddlluu

This specimen has been composed of alternately new and old matrices. The font from which the old matrices were taken has been in daily service over a period of several years. The most frequently used characters, susceptible to the greatest wear, are employed to show the difference in letter alignment between new and well used matrices. Some of the lugs are worn as much as 0.015 inch. The first letter of each pair of characters represents a new matrix, and the entire line was cast from normal position. In order to secure correct letter alignment, the only remedy would be a replacement of the matrices having defective lugs. Replacement of the principal lower case characters, together with quads and leaders, will usually restore the alignment qualities of a matrix font.

quads and leaders (em and en) are first to show necessity for replacement.

The lower matrix lugs, both front and back are susceptible to greater wear than the upper lugs, not only on account of being half the length of the upper lugs, but the matrices on being delivered into the assembling elevator strike and come to rest upon the elevator rails by means of the lower lugs and while resting upon the rails are also pushed along upon the same lugs by incoming matrices.

The lower front lug, upon which depends the good aligning qualities of the matrix character when used in auxiliary position, is the first to show the effects of use. To preserve the alignment point of the lower front lug, it is essential that the assembling elevator fiber buffer be kept in good condition at all times.

eettaaooiinnsshhrrddlluu

The same matrix line as shown in No. 1 above (two-letter matrices) but cast from auxiliary or duplex-rail position. Notice that the letter alignment is not as good as in specimen No. 1. This is explained by the fact that matrices in auxiliary position depend wholly for their letter alignment upon the two lower matrix lugs. The matrices rest in the first elevator upon the duplex rail and when the elevator rises for alignment, the duplex rail is pushed upwardly against the underside of the lower front matrix lugs which in turn causes the top of the lower back lugs to bear against the underside of the mold aligning groove rail. It can be readily seen that if very much wear has taken place on the lower surface of the lower front lugs, letter alignment will be immediately affected—that is, it will be readily perceptible to the eye when the lines have been printed upon paper.

The lower back matrix lug wears more rapidly than any of the others, but its aligning qualities are not impaired by use as readily as the lower front lug since the aligning point is on the upper surface.

CAUSES FOR IRREGULAR LETTER ALIGNMENT

Some of the causes for irregular letter alignment are as follows:

1. Worn matrix lugs.
2. Sheared matrix lugs.
3. Worn adjusting bar in first elevator front jaw.
4. Nicked or bruised aligning rail in first elevator front jaw.
5. First elevator is not parallel with the mold aligning grooves.

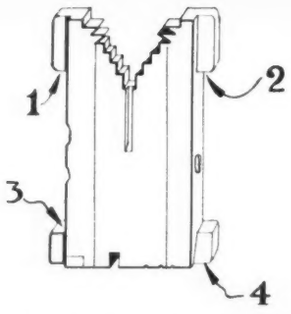
If this condition is present in the machine, it may be caused by improper adjustment of the first elevator slide gibs or the parallelism was not tested at the time of replacing mold disk locking studs and stud blocks. In order to test the parallelism, first adjust the two upper slide gibs to align the first elevator jaws with the delivery channel, permitting about 0.005 inch space between the jaws and channel rails. Then, while the

eettaaooiinnsshhrrddlluu

This line was also cast from the same matrices as shown in No. 1. The letter alignment is equally as good as No. 1. The matrices were held in normal position in the first elevator jaws, but have been elevated by means of the two-letter attachment or "flopper" so that the lower back matrix lugs will enter the auxiliary aligning groove in the mold face, thus casting an auxiliary face from matrices held in normal alignment position. Where entire lines are to be cast from matrices having worn lugs, either in bold face or italic, the two-letter attachment provides a means of obtaining better alignment than can be obtained from use of the duplex rail.

elevator slide is at transfer position, adjust the two lower gibs to align the elevator jaws with the transfer channel, allowing 0.005 inch space between. Next test the first elevator jaw-mold parallelism. Run the machine forward to casting position, open the vise to first position, adjust the vise jaws to 30 ems and place a thin *new* pi matrix at either side of the first elevator jaws approximately 28 ems apart. Close the vise. Back the machine by means of the first elevator cam. Depress the mold cam lever handle. Pull the mold slide forward to engage the locking studs with the stud blocks. Wedge a screwdriver between the first elevator cam roller and the cam. This will cause the first elevator to rise under compression for alignment of the two matrices in the jaws. Next grasp each matrix in turn with a pair of tweezers to see if the lower back lugs equally engage the aligning rail in the mold face. If one of the matrices is loose it will be an indication that the elevator adjusting bar is not parallel with the mold aligning groove, and it will be necessary to remove the first elevator head and take out the key which locates its position on the slide. The key should fit snugly into its way in the front jaw so that when the jaw is taken from the slide the key will remain in the jaw. Pien one side of the key for about half its length and dress off the other side of

the key to tilt the jaw enough to cause it to be parallel with the mold aligning grooves. Both matrices should bind equally under compression in order to obtain perfect letter alignment.



Referring to Fig 1, this line was cast from matrices in normal position—that is, the matrix alignment points *2* and *3*, *Fig. 4*, of the second letter of each character show comparative alignment with the new matrix which is the first letter of each character. As a rule, letter alignment is not dependent upon lug *1*, this lug merely being a supporting element of the matrix. The second lower case "n" shows the worst alignment because the matrix lugs have been worn at all three normal aligning points *(1-2-3, Fig.4)*, and when placed between the new "n" and "s" matrices its misalignment is distinctly noticeable. The second letter of each character is out of alignment more or less according to the state of wear, which may be from 0.002 inch to 0.015 inch.

Since all the letter characters in matrix lines are cast in an inverted position, the matrices having worn lugs drop down, but when printed upon paper they have an elevated appearance.

Specimen No. 2 was cast from an auxiliary-positioned matrix line. The alignment points are shown at *3* and *4*, *Fig. 4*. The letter alignment in this specimen is not as good as that shown in specimen No. 1, because the first elevator jaw duplex rail pushes upwardly again the lower surface of the lower front lug *4*, *Fig. 4*. The aligning points 1 and 2 do not come into play when matrices are cast in auxiliary position.

The alignment of the letters in specimen No. 3 is identical with No. 1 because the matrices were held in normal position but were elevated to auxiliary position by the two-letter attachment or "flopper." Provided the compression of the first elevator link spring is good, letter alignment will be just like that of the normal-position alignment.

Some Points on Melting Metal

By JAMES V. MARTIN*

PRE-MELTING and pigging type metal do not always receive proper attention. Metal should be treated as one of the most important elements of the printing business.

It seems to be the prevailing idea in the average printing plant that the melting of the metal is an unimportant thing and the matter is generally entrusted to anyone who is able to handle a shovel. The opposite is true. A man to do this work should have proper instruction so that the metal may be treated with the greatest care.

In the first place, line-slug metal should not be heated beyond 600-650 deg. F., and monotype not over 675-750 deg. F. The elements composing the alloy are lead (the base) melting point 621 deg. F., antimony (the hardener) 1166 deg. F., and tin (which gives fluidity to the alloy) 450 deg. F. When alloyed, the melting point of the alloy is greatly reduced below the melting point of the antimony, so the temperature at which they are remelted should not be too high.

The metal should be stirred from the bottom of the pot toward the top. This will equalize the heat, as the greatest heat is next to the sides and bottom of the pot.

All metals in a molten state have a strong affinity for oxygen, and the higher they are heated, the stronger the affinity is likely to be. Consequently, excessive dross, especially of tin and antimony, results. As the dross is skimmed off, the tin content lessens with each melt, as tin oxidizes more rapidly than lead and antimony. A great many melters are under the impression that the dross is a dirt and the more frequently it is skimmed off the purer the metal will become, but a small percentage has its use as is stated later.

In melting, the metal should be thoroughly mixed in order to obtain a perfect alloy. Poor metal well-mixed is better than a good metal poorly mixed, or not mixed at all. In nearly all plants practically no mixing is done, or if it is, it is just a simple movement for a few seconds.

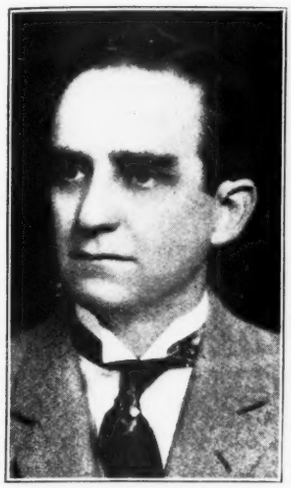
Metal should be kept covered and air excluded, both in melting and mixing, because when exposed to air, rapid oxidation occurs. Only a portion of the dross should be removed, leaving sufficient for a covering, thus partly excluding the oxygen. A bottom-pour pot is best, as a covering of dross can be allowed to remain on the surface. If metal is ladled into molds, only enough surface should be skimmed back to dip the metal, always bearing in mind the deteriorating action of oxygen.

In conclusion, if metal is kept well protected from the air while in a melted state, there will be a substantial reduction in dross. Reduce the dross and you will be well paid for the trouble. Never overheat, keep air from metal and be sure the metal is thoroughly mixed, but always protected in the mixing to keep out the air, as the mixing will expose fresh surfaces to the oxidizing action of the air. If more attention is given to the remelting, there will be far less trouble with clogged mouth pieces, less loss in metal and better type; moreover longer life will be imparted to the metal.

*Representative, Monarch Monometer Mfg. Co., Baltimore, Md.

Charles P. Howard---Labor Leader

By MAC SINCLAIR



Charles P. Howard, President of the International Typographical Union. His democratic administration has made him popular.

CHARLES P. HOWARD, President of the International Typographical Union, was born in Christian County, Illinois, September 14, 1879. At the age of 10 he removed with his parents to western Kansas, where at the age of 12 he began "deviling" around the office of a small country weekly newspaper, outside of school hours. Before reaching the age of 20, during which time he lived in Oklahoma and Missouri, Mr. Howard was compelled to accept family responsibilities as a result of the death of his father. This necessitated a return to country printing offices as a method of earning a livelihood for himself and those dependent upon him.

After several years in and out of the trade, never at any time working in the jurisdiction of a typographical union, Mr. Howard went to the Pacific Coast and landed in Tacoma, Wash., where he made application to become a member of No. 170 in January, 1907. After having been elected to membership he was sent by the secretary of Tacoma Union to Walla Walla, Wash., where a call had come from the *Morning Union*.

Later in the year he deposited a traveling card with Multnomah Typographical Union No. 58, Portland, Ore., and remained a member of that union for more than ten years. During his affiliation with No. 58, he served his union in every capacity from reading clerk to president.

In 1916 he was elected a delegate to the Baltimore convention and led the fight to return to the Book of Laws the priority law which had been nullified by the Los Angeles convention 1915. He also represented No. 58 as a delegate to the Albany convention in 1920. Was a visitor at Scranton, 1918, Atlantic City, 1922, and was appointed reading clerk by the late President McParland at Quebec, 1921.

While serving as delegate from Multnomah Union to the Central Labor Council of Portland, Mr. Howard was successively elected president of that body. Early in 1918 he was called upon by Secretary of Labor William B. Wilson to serve with the United States Department of Labor in war work. After extended tours, during which time he addressed labor organizations in many sections of the country, he was placed in charge of a governmental bureau of publicity and efficiency in industry as acting director.

As a commissioner of conciliation, and as representative of the U. S. Secretary of Labor, Mr. Howard handled many important disputes and strikes which involved workers engaged in production of war materials. He also represented the department upon important committees and commissions which formulated policies for the conduct of various governmental activities.

On November 15, 1919, he resigned from Government service and assumed active management of the printing establishment of one of the railroad organizations affiliated with the American Federation of Labor. He remained in that position until he assumed the duties of first vice-president of the International Typographical Union, to which office he was elected in May, 1922.

At the International election in 1920, Mr. Howard was made delegate to the American Federation of Labor by the highest vote accorded a candidate for that office up to that time, excepting Secretary Frank Morrison, of the A. F. of L. At the Denver convention, the first he attended as an International delegate, he was appointed a member of the committee on resolutions and had an important part in the contest to have the

Continued on page 24

The Union Printers' Home at Colorado Springs, Colorado, which is maintained by the membership of the International Typographical Union. Its affairs are administered by the International officials and a board of trustees.

Standardization and Air-Conditioning

By WILLIS H. CARRIER*

(Continued from May Issue)

Willis H. Carrier, an Authority on Humidifying and Ventilating Systems for the Printing Trade.

As before stated, it has been found impossible to segregate the cost of these individual delays. But in their total we can, by the examination of air conditioned plants prophesy with some confidence that their elimination will result in an increase of at least 8 per cent in press production, or to state it conversely, that the cost per 1,000 impressions (the unit cost) over the course of a year should decrease 8 per cent.

Such a saving, in an average shop doing an average grade of work, at average costs and percentages of productive time, will amount to $324 per year per medium cylinder press. It may be calculated for the equipment of any individual shop.

Similarly it has been found from experience that a saving of 10 per cent may be secured in folding-machine operation, a substantial saving in roller and ink bills made, and indications point to a decreased loss of time due to sickness on the part of the personnel.

ESTABLISHMENT OF STANDARDS

However, in the lack of standards in the printing industry at present each plant manager believes that there are special features about his own business which make it "different" from others and not to be judged by their experience. In such cases therefore we can only suggest that each plant must set up its own standards, or at any rate data from which production can be measured. Such information, we believe, if carefully compiled will give a very close approximation of the probable economic worth of air-conditioning equipment, and at the same time give the plant manager the opportunity of putting his finger on a number of other sore spots which may appear.

PROCEDURE FOR ESTABLISHING STANDARDS

In connection with the establishment of some such standards we have in mind the following procedure: Take from the files samples and cost summaries on all the jobs done over the course of a year. Let us study in this case only the presswork. Classify these jobs into a sufficient number of classes so that the jobs in each class will be fairly similar in type of stock, type of form, closeness of registration, and other items which would affect the speed of production. The printer's study would take him over the individual jobs in each class, and he would determine the normal number of impressions per hour for the whole class. It is safe to say that such a study would reveal some surprising abnormalities. Individual jobs of practically identical character may vary in running time from the normal by as much as 50 per cent over or under. Take job A, which ran at 1,000 an hour, and job B, which ran at 2,000 an hour, and eliminate any factor of the two jobs which would indicate to a practical man that there should have been a difference in running time, and you will find there is left over a large unaccountable margin of too much or too little production. If there is any way in which these abnormalities of production can be accounted for except by the influence of weather on stock, machines, and personnel, we have yet to see this explanation. A similar method can be applied to make-ready time and to bindery operation.

EACH PLANT A PROBLEM OF ITS OWN

We have no hesitation in affirming that such a method applied to the production records of most plants would show a very appreciable saving from the installation of air conditioning equipment. There does not seem to be any general rule as to the air-conditioning requirements of a printing plant. It is a question to be determined by the return balanced against the cost.

FACTORS INVOLVED IN AIR-CONDITIONING

However, in studying this question we believe that it would be desirable for the industry to be informed as to just what factors an air-conditioning system involves. In other words, we think the printer ought to know the outline of the subject in order that when he buys the system he may have some idea of just what he is buying in relation to his needs.

The control of atmospheric conditions involves controlling five separate characteristics of air: (a) Temperature, (b) Humidity, (c) Air movement, (d) Cleanliness, (e) Ventilation.

A complete air-conditioning system must control all these characteristics and insofar as it omits to control any of them in that measure it is an incomplete system. Each of these features has its individual importance to the printing industry.

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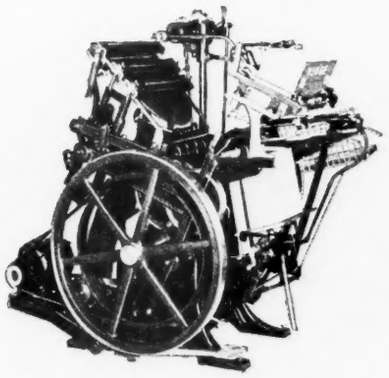
*President, American Society of Heating and Ventilating Engineers. Abstract of paper presented at the second conference of technical experts, Washington, D. C., Printing Industries Division, A. S. M. E.

The New Kluge Automatic Press

THE Kluge Automatic Platen Press, it is claimed by the manufacturers, is a new type of job press incorporating the well-known Kluge Feeder as an integral part of the unit, and it is further claimed that its manufacture was inspired by the fact that the conventional type platen press has limitations which restrict the full operation of mechanical feeding.



The press has many distinctive features, chief among these being an improved system of distribution, greater speed and impressional strength and advanced constructional methods.

To obtain the results desired, the press has been given a wider leg spread and heavier side frames and base, placing the weight where it contributes most to positive rigidity. Balancing this, aluminum alloys have been used in constructing the reciprocating parts, assuring absolute stability and absence of vibration.

NEW KLUGE DISTRIBUTION

The ink fountain is simple and easily accessible. The distributing rollers, of which there are two composition with one metal rider, operate between the fountain and the disc. They do not come into contact with the form or form rollers.

The lower two sets of rollers, composed of four form rollers and two vibrators, operate from the disc to the form, never touching the fountain or the distributing rollers. By this method only that ink which is thoroughly distributed is conveyed to the form. Vibrating and riding rollers are adjustable to contact with the composition rollers, thus offering no resistance to the turning of these rollers.

THE INK FOUNTAIN

The ink fountain has fourteen adjusting screws and is made with a hollow steel tube, ground to a perfect finish and extending the width of the form. The blade is of saw steel and removable for cleaning. The fountain is automatically thrown off when the impression is thrown off.

The movement of the disc is quite nominal, sufficient however, to obviate lines and streaks and to enable the pressman to obtain control of color, so that more or less ink can be supplied wherever required. The racheting mechanism is positive in action and turns the disc a given distance, then locks it prior to the crossing of the rollers. The form rollers do not stop the rotation of the disc.

In washing up, the disc can be lowered. This is also a helpful feature in disengaging paper from rollers.

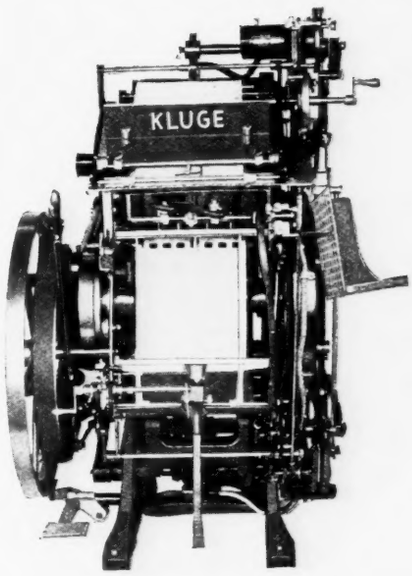
Micarta roller trucks, one set of regular size and one set 1/16-inch undersize, are standard equipment. This composition truck when in operation presents sufficient rolling friction to insure turning of form rollers and eliminates weight.

GREATER SPEED

It is also claimed by the makers that the new Kluge Automatic Platen Press can, under proper conditions, develop a printing speed faster than any other platen press. This is due to refinements of construction which insure rigidity on the one hand and balance on the other, permitting the machine to operate at high speed without adverse influence upon register and impression.

OTHER FEATURES

The new Kluge Press is equipped with depressible grippers which do not release their hold on the sheet until the delivery



suction tips come into contact with it and an automatically operated jogger which will hold twelve inches of stock. A stock shelf is placed on the right side of the machine for convenience in keeping the magazine loaded.

Oiling has been amply provided for by large oil holes, wick packed. On the more important bearings an oil reservoir is used. All such important bearings as the side arms are bushed and have a built-in reservoir, enabling proper contact between bearing materials.

Denman Talks

Frank T. Denman, department of typography of the Mergenthaler Linotype Company had a busy day and night in Columbus, Ohio, Monday, May 11, when he gave illustrated talks on typography before three different groups.

At noon he discussed "The Trend of Typography," at a luncheon meeting of the Advertising Club of the Chamber of Commerce, at the Chittenden Hotel. In the afternoon he talked to members of the advertising classes at Ohio State University. At night, at the Fort Hayes Hotel, he addressed members of the Printing Arts Association, on "Blueprints for Printers."

All three sessions were well attended and the speaker and his subjects were enthusiastically received. To the meeting at the Fort Hayes Hotel many members of the Printing Arts Association brought various members of their staffs. Following each talk Mr. Denman answered many questions on typography.

The Point System

By W. E. WINES*

CORRESPONDECE between members and the Mechanical Department with reference to changes in page make-up or paper roll widths has disclosed that the point system of type measurement is but imperfectly understood. This statement applies not alone to newspaper men but also to some in the machinery and supply business. Hence, a brief statement of the facts is in order.

Four values of the point are in use and are listed in the table below:

A. .01388-8/9 inch or 72 points equal 1.000 inch.
B. .01383-1/3 inch or 72 points equal .996 inch
C. .013837 inch or 72 points equal .996264 inch
D. .014 inch or 72 points equal 1.008 inch.

VALUE "A"

Value "A" is used by John Royle & Sons in laying out gauges and micrometers used on machinery manufactured by them. It is also used by the Mergenthaler Linotype Company and by the Intertype Corporation in the design and manufacture of liners. In other words, this is the value which should be used in calculating the length of slug cast on either a Linotype or Intertype. Thus, if a mold is fitted with liners to cast a 12-em slug (pica ems), the mold cavity will be exactly two inches long. For a 12½-em slug it will be exactly 2-1/12 inches long. The length of the slug will be slightly less than that of the mold, due to contraction of the metal on cooling. For the body measurement (thickness) of the slug value "D" should be used, as will be explained later.

VALUE "B"

This value is used by Lanston Monotype Machine Company, Ludlow Typograph Company and H. B. Rouse & Company. It is used also by the Mergenthaler and Intertype companies for set-wise measurements in the design of type faces and the manufacture of matrices. The following is quoted from one of the Linotype Company's publications:

> The standard of measurement adopted by the Mergenthaler Linotype Company is the pica em, measuring .166 inch, which is the standard decided upon by the United States Typefounders' Association in 1886, and now adopted by all American typefounders. One point is one-twelfth of the pica, or .01383-1/3 inch. All Linotype matrices are made on a point-set basis, with one-quarter point as the unit.

Letters received from the Miller Printing Machinery Company and F. Wesel Manufacturing Company are not entirely clear, but apparently are intended to convey the information that value "B" is the one they use. The Miller company submits a table giving the value of one point as .013837 inch (value "C"); but this table lists nonpareil as .083, pica as .166 and 72 points as .996. The Wesel company states: "Our point system of gauges is based on a point of 1/72 inch, or .0138." The table submitted lists nonpareil as .083 and pica as .166.

VALUE "C"

This is the value used by Barnhart Brothers and Spindler, American Type Founders Company and (probably) by other type founders.

The first named foundry has written as follows:

> All the standards and gauges used in our type founding, brass rule, and lead and slug departments are based on the value of the point as .013837 inch. On this basis,

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*Manager, Mechanical Department, American Newspaper Publishers' Association.

William Feather's Reflections on Business

William Feather President of the William Feather Printing Co., also contributes to Nation's Business, Philadelphia Public Ledger, New York Evening Post and Chicago Daily News.

As we have said before, life is amusing and colorful if you have a sense of humor.

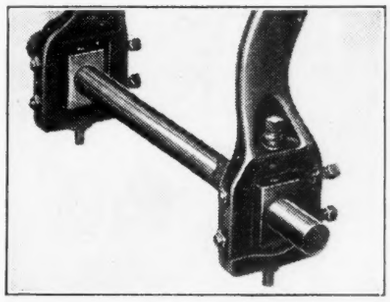
For twenty years one man has been editor of a noted newspaper. Scores of brilliant men have been on his payroll. They have come and gone, but the editor has remained.

Through his long service the usual comment on this editor has been, "Not a bad fellow, but dumb. What an opportunity he misses to create a great newspaper!"

Meanwhile the circulation of the newspaper has more than kept pace with the growth of the city. Mostly through merit it has eliminated competition, until now it is the sole survivor in the morning field.

One therefore wonders whether this editor would be better off if he had more ability. The chances are he would use his talents to raise hell. Instead, he steers a safe course, pleases almost everybody, offends nobody and makes a lot of money for himself and his employers.

LINOTYPE LEADERSHIP



ADJUSTABLE Pot Leg Bearings

Lining up the pot mouthpiece with the mold is a simple Linotype operation, because of the adjustable pot leg bearings. The bearings are individually adjustable to four positions—making it easy to secure the kind of lock-up that prevents back squirts, and that insures good solid slugs and excellent printing faces.

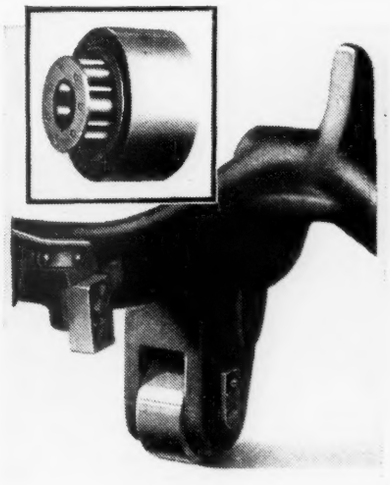
As illustrated, the Linotype pot moves on solid, substantial bearings with convenient oil holes for lubrication—not on bushings. This exclusive Linotype design insures positive, permanent adjustment, and is a convenience to machinists and operators.

ANTI-FRICTION Roller Bearings To Relieve Strain

In the pot lever roll and pot pump lever roll—the points of greatest strain in the casting mechanism—the Linotype is equipped with anti-friction roller bearings of the latest, most approved design.

Notice the seven hardened and ground steel rollers assembled in the compact cage. The inside surfaces of the rolls revolve on the pin bearing, while the cam roll revolves on the exterior surfaces of these rolls.

This is the only type of bearing which will stand up under the tremendous pressure incidental to a perfect lock-up, and the force exerted by the pot pump spring.



MERGENTHALER LINOTYPE COMPANY

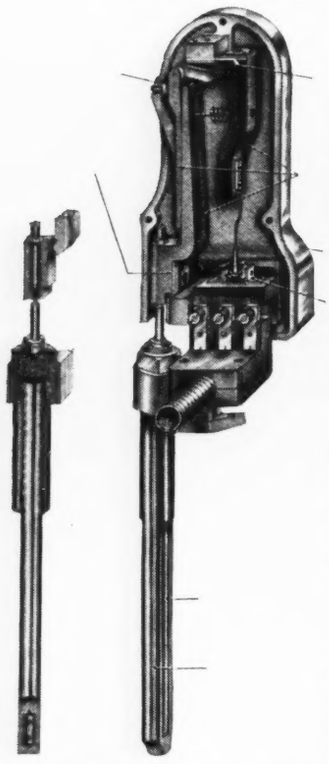
BROOKLYN, N. Y. · SAN FRANCISCO · CHICAGO
NEW ORLEANS · Canadian Linotype, Limited, Toronto
Representatives in the Principal Cities of the World

® TRADE LINOTYPE MARK ®

LINOTYPE METROBLACK AND METROLITE 562.30.10 C

Latest Printing Equipment Mechanisms

Mechanical Thermostat for Electric Pot



The Mechanical Thermostat for the Linotype Electric Pot functions by the expansion and contraction of two unlike metals. No mercury is used. The expansion element is a sturdy aluminum bar (supported by a slotted Invar tube), which withstands considerable over-heating without deterioration. This bar may easily be adjusted or replaced by any machinist or operator.

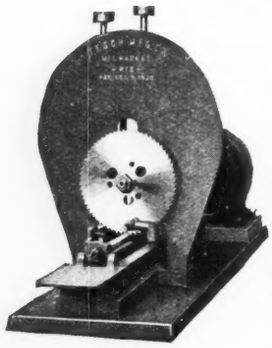
Through the use of the best suited metals and a correctly designed leverage system, close regulation of temperature is obtained, as well as permanent setting of the Thermostat.

The two elements used in the expansion system (the slotted Invar Tube supporting a sturdy aluminum bar) have the greatest difference of linear coefficient of expansion of any two metals that can be used at correct operating temperature, so that maximum movement of contact for the complete range of temperature is obtained with the shortest possible leverage.

The leverage system consists of strong, short levers, which are unaffected by self-expansion. These levers operate on an improved spring suspension system, free from friction and wear. The entire mechanism is supported and enclosed in a compact cast-iron housing.

The Mechanical Thermostat is simple and trouble-free in operation. It may be applied to outstanding electric pots of both the Linotype and the Cutler-Hammer type. Write the nearest Linotype Agency for detailed information.

Tesch Automatic Saw Filer



Any composing room using circular saws should be equipped with a Tesch Automatic Saw Filer. In this way, no one need work with dull saw blades. Since the saws are kept sharp so easily, better work and more of it may be obtained from the saws.

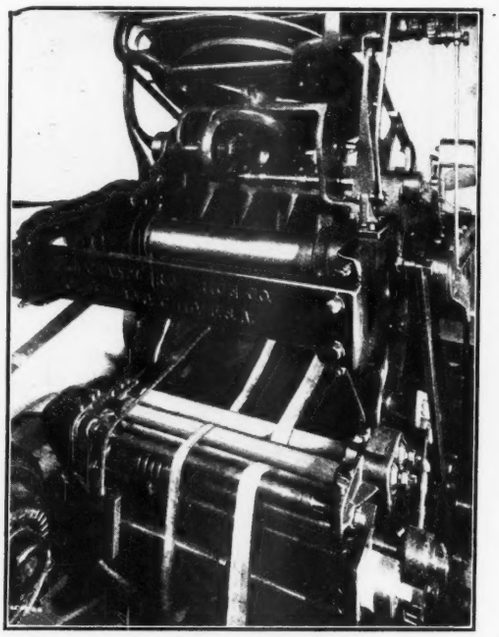
The Tesch Saw Filer is supplied either for hand or motor power. The power machine is equipped with a General Electric or Westinghouse motor.

This Saw Filer will automatically sharpen circular wood and metal-cutting saws from 3 inches to 10 inches in diameter, having any number of teeth. The machine is very simple in operation, as only two adjustments are required when filing. When proper adjusted, it needs no further attention and will continue to file until all the teeth are of uniform shape. The file is adjustable as to angle and pitch. All working parts are hardened. Made by The Tesch Mfg. Co., 57 Twenty-seventh St., Milwaukee, Wis.

New Peerless Roll Leaf Attachment

In keeping with an established policy to develop roll leaf attachments for various types of printing and stamping presses, the Peerless Roll Leaf Co., Inc., 911-917 New York Ave., Union City, N. J., has brought out a new Special Model Roll Leaf Attachment for Chandler & Price 14½x22, Special Heavy Duty Presses.

This attachment conforms to the style of the press. It possesses the outstanding advantages of all Peerless roll leaf attachments: rugged construction, accurate feeding, and



Rear view of Special Heavy Duty Chandler & Price press equipped with Peerless Special Model Roll Leaf Attachment.

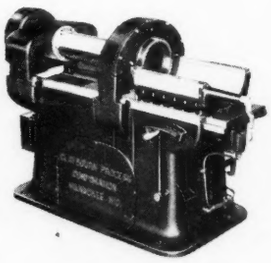
economical operation. It is built to give years of satisfactory service.

The attachment is located at the lower rear of the press, where vibrations do not affect the accuracy of the roll leaf feeding mechanism. It can be easily reached in order to set up rolls of leaf or adjust the feed. Bronze powder cannot get into the fountain, distributing table or rollers. The attachment is driven by the motion of the press itself.

The price of the attachment includes a bracket for holding the leaf, all necessary breaker bars, etc.

Net weight: 225 lbs. Shipping weight: 335 lbs.

Claybourn Precision Boring Machine



Boring, or reducing the thickness of curved printing plates after they come from the caster, is an operation of great importance.

Correcting faulty printing plates on the press is a costly, laborious, time - consuming operation. With modern precision machinery, printing plates can and should be made and tested for their printing quality and fitness before they are put on the press. Even moderately short runs can be made profitable by the use of perfected and pre-tested plates.

It is claimed by the Claybourn Mfg. Co., Milwaukee, Wis., that no machine operation can be more accurate than the

Continued on page 21

This illustration shows additional drying tables on each side of moulding machine

Hydromat

Direct-Pressure Hydraulic Matrix Moulding Machine

THE "Hydromat" Direct Pressure Moulding Machine reproduces more faithfully than any machine that has been used heretofore.

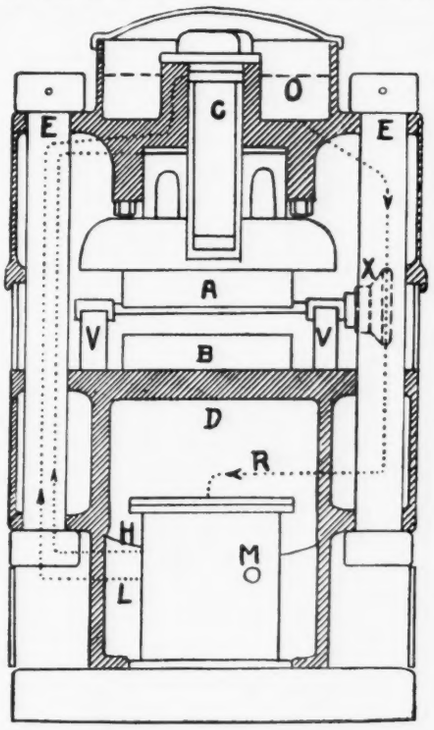
The mould made on this new machine is equal in every respect to the leadmould process. Tone values, no matter how fine, are faithfully reproduced.

The working principle of this new mat press is illustrated in the cross-sectional diagram. The type form or other matter is placed upon the fixed platen B under the movable platen A. The lower platen B rests on a heavy electro-nickel steel casting of generous dimensions, while the upper platen moves up and down with the piston.

An unusually long guide C provides perfect parallel motion and assists greatly to take every strain of the packing.

The cylinder, carrying on top the oil reservoir O, is mechanically connected to the lower yoke by four special high carbon steel 4½-inch columns EE. A motor-driven pump M delivers the oil under pressure up to 150 pounds per square inch through line L into the upper part of the cylinder for fast motion, and oil under pressure up to 5000 pounds per square inch through line H into the main piston.

The piston on its downstroke comes to two adjustable stops VV, thereby leaving between both press platens AB exactly sufficient space for the set, the mat and a special elastic cushion. These stops VV can be adjusted by the means of a hand-wheel X, which is graduated to one-thousandth of an inch. It is claimed that the press works entirely independent of the size or nature of the set.



Mats pressed by this process show perfect, even and exceptionally deep impressions not achieved before on any kind of mats. The plate cannot be crushed, nor can the elastic cushion be overstrained, which will insure long life. The press, however, may be used in the old way, *i.e.*, with cork or felt cushions, independent of the stops VV. The Hydromat moulding machine is made in full-page and double-page newspaper sizes.

• • •

ELECTROMAT FLONGS. We have exclusive rights for the new black surface mat which is a revelation to stereotypers. This new mat flong is made exclusively for direct pressure presses and can be used on any press now in use. Price on request.

• • •

USERS OF MATS. Until now there was no mat, wet or dry, that could be sent to newspapers with the positive assurance that halftone illustrations and type would print as clearly and faithfully as an original form or electrotype. The new Electromat has changed this. Here is a mat, with a clean, smooth surface, metallic in appearance, from which stereotypes can be cast with the fidelity of the original plate. It will not blister nor will there be perceptible shrinkage. Sample mat sent on request.

• • •

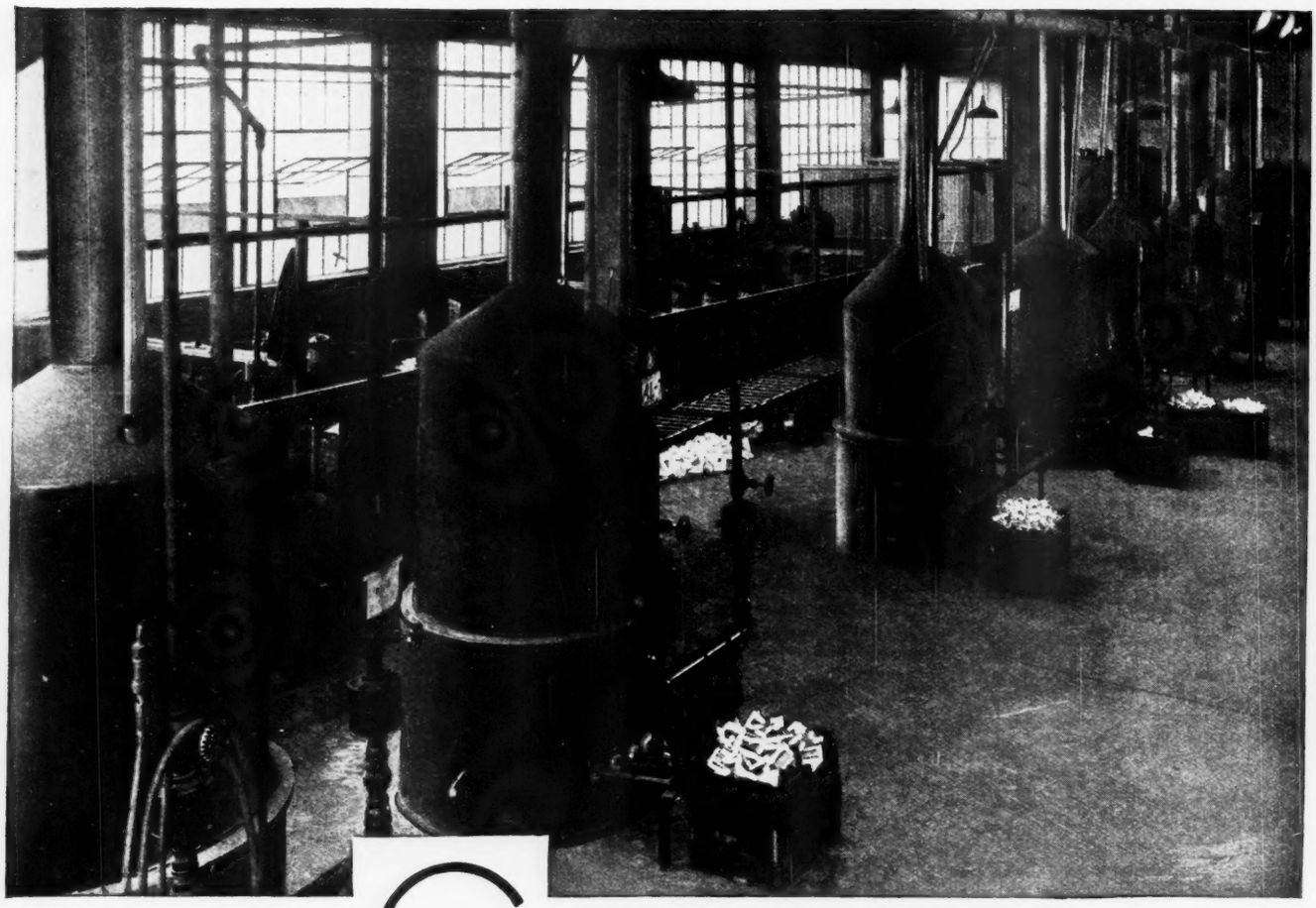
Mr. Edgar Rodd, whose 14 years experience as Sales Specialist on Plate-Making Machinery, will be glad to answer your request for further information as to how the "Hydromat" can best serve your Plate Making Problems.

FINE SCREEN MAT CORPORATION

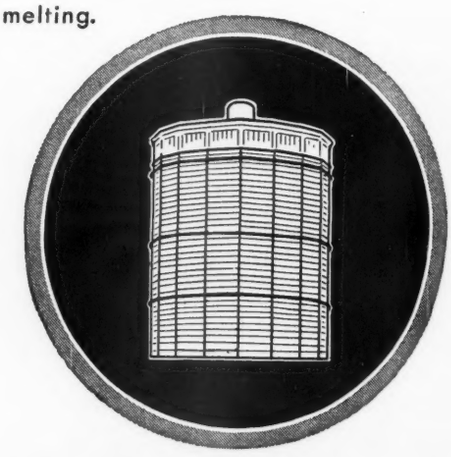
EXCLUSIVE SALES AGENTS

228 E. 45th Street, New York City . Tel. VAnderbilt 3-5490

GAS HEAT FOR SOFT METAL MELTING



GAS provides the best possible heat for soft metal melting operations: it quickly attains the proper thermal head, and—what is at least *equally* important—it maintains it with a tolerance of but few degrees. The new book "Gas Heat in Industry" contains definite information about the application of gas to soft metal melting. You should have a copy.



AMERICAN *Gas* ASSOCIATION

420 Lexington Avenue, New York

GAS FOR HEAT
WHEREVER HEAT IS NEEDED

Intertype's New Magazine Shift

By L. W. Willis*

Several requests have come to the office of Printing Equipment Engineer for a descriptive article on the new Intertype magazine shift. In response to these requests, L. W. Willis gives a detailed technical description of all the movements involved in changing from one magazine to another which, we are sure, will satisfy those who are interested in this new mechanism.—Ed.

THE magazines and their frames form a rigid unit which is movably supported in the machine on rollers on the bottom magazine frame and by resting freely at the lower end on a cross shaft *A*.

To shift from one magazine to another, the shaft *A* is turned and its pinions which engage the toothed racks at each side transmit the desired forward or backward movement to the magazine unit through the connecting links *C*.

Instead of the operator turning a handle on the shaft *A* as heretofore, this shaft is now provided with a chain and sprocket gearing connected to the shifting handle *D* located at the right of the keyboard within easy reach of the operator without leaving his seat.

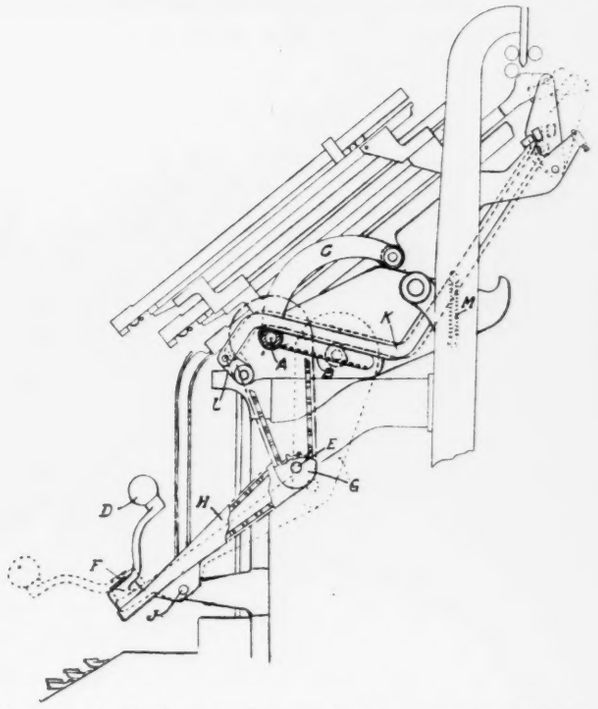
The new shift comprises a sprocket on the shaft *A* connected by a chain to a smaller sprocket keyed on the lay shaft *E*. A second sprocket fixed on the shaft *E* is connected by a chain to a still smaller sprocket keyed on the stub shaft *F* to which the shift handle *D* is pinned. The upper sprockets and chain are enclosed in a housing *G* which pivots on the end of shaft *A* and on the lay shaft *E*, while the lower sprockets and chain are enclosed in a housing *H*, which also pivots on the lay shaft *E* and rocks vertically on its support *J*, secured to the intermediate bracket.

The fact that both housings are thus free to pivot on the lay shaft *E* and their opposite ends can rock on their respective supports, allows free movement when the shift handle *D* is turned. The drawing shows clearly how the two housings change position when the shift handle is turned to carry the magazines backward to the dotted line position.

The dotted line position in the drawing represents the condition of the parts when the shift from the middle magazine to the bottom magazine has just started, the shift handle *D* requiring three turns to complete a shift from one magazine to the next. This position is chosen to show another feature whereby the channel entrance is automatically moved out of the way while shifting magazines.

Instead of the operator throwing the channel entrance open and closing it again after shifting magazines by a separate handle linked to the lower end of the connecting rod, *K*, as heretofore, this separate manual operation is now replaced by an automatic channel entrance control. The shaft *A* has a collar† at the right-hand end and the rod *K* lies parallel to the toothed rack *B* and normally rests on a flattened portion of this collar. The forward end of the rod *K* is freely connected to a short crank *L* pivoted on a stud in the intermediate bracket and a tension spring *M* pulls downward on the rod *K* to aid in overcoming the weight of the channel entrance when swinging upon its support studs and to close it firmly against the magazine.

When the shaft *A* is turned by operating the magazine shift handle *D*, the full diameter portion of the shaft collar raises the rod *K* and the crank *L* swings upward while the channel entrance swings open about its pivot studs sufficiently to clear the moving magazines. Toward completion of the shift, the flat portion of the shaft collar again reaches top position and through the pull of spring *M*, the rod *K* is lowered so that the channel entrance swings to closed position.



Diagrammatic side elevation of the new Intertype magazine shift, showing how three turns of the handle "D" automatically opens the channel entrance, changes the magazine and closes the channel entrance to operating position.

As already pointed out, three turns of the handle *D* are required to shift from one magazine to the next one. Accordingly, the shaft *A* turns only once and the eccentric connection of links *C* on shaft *A* together with the eccentric cranks on that shaft for lifting the forward end of the magazine unit to clear the reeds, permits turning the shaft *A* slightly at the beginning and end of the shift without actually moving the magazines forward or backward. During this idle period the rod *K* is operated so that the channel entrance is thrown open just before the magazines move and closed just as they come to rest in the next selected position. It will be observed that the entrance is moved only far enough to clear the magazines.

The bearings for the lay shaft *E* in the chain and sprocket housings are bushed and provided with oil cups and the chains are lubricated with graphite grease. The lower chain runs on a vertically disposed sprocket on the lay shaft *E* and a horizontally disposed sprocket on the shift handle shaft, so that it has a half-turn. For this reason a wide chain is used and the sprockets are specially beveled to insure perfectly free engagement of the chain links on the teeth.

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*Assistant Supervising Engineer, Intertype Corporation, Brooklyn, N. Y.

†This collar with the flattened portion on shaft *A* is illustrated in the center of the dotted-line position of the upper chain housing, just above the rack *B*.—Ed.

VAPO SYSTEMS
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HOW much would you give to have the best printed newspaper in your city, and every edition out in schedule time?

This you may have, without the sacrifice of a dollar!

Vapo Systems, Inc., will not only help you attain this ideal objective, but will *actually save you money* in the bargain.

Think of the advantages and economies in a device that automatically saves thousands of dollars a year in print paper bills and 10% to 15% of the cost of ink; an invention that radically *reduces labor costs* and prolongs the life of press blankets and rollers!

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Vapo Systems heads are not unwieldy wasters of space—they are compact brass cylinders fitted snugly onto the press frame so as to project a fine vapor mist directly onto the speeding web just before it contacts the printing cylinders.

The operation cost of Vapo heads is nil, and they will last as long as the press itself. This system will *pay for itself in savings* in less than a year. The installation cost is in reality an investment with guaranteed dividends of perpetual character.

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Vapo Systems
Incorporated

211 WEST WACKER DRIVE CHICAGO, ILLINOIS

Latest Equipment Mechanisms

Continued from page 16

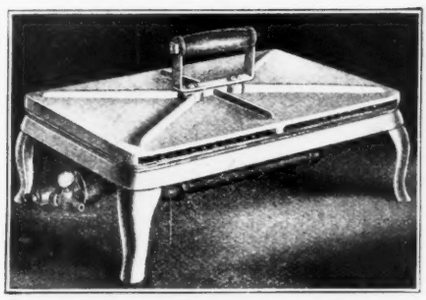
machine upon which the operation is performed. Deflections and resulting irregularities of surface varied with the depth of cut taken from the plate on old-style boring machines, due to errors in design and construction of the machine itself.

The new Claybourn Boring Machine, on the contrary, is built like a fine lathe or milling machine. The cutting head remains stationary. The knives are mounted in a rotary tool holder, revolving in roller bearings, supported by a rigid housing and bearings. The plate to be bored is firmly chucked in a precision-machined bed and is propelled under the revolving knives. As a result, no deflection can take place.

The box or "chuck" containing the plate is drawn forward past the cutting head by means of an oil gear pump and cylinder which assures an extremely smooth drive and a variable feed. This oil gear feeding mechanism also makes the machine wreck-proof because, in case of a jam, relief valves open and prevent damage. The oil gear also facilitates rapid return of the box after the plate has been removed.

Reliable Dry Mat Scorcher

The majority of printers and publishers using a stereotype flat casting box do not have the proper facilities for the drying of mats before casting. In the majority of cases the mats are placed over the metal pot which causes uneven drying and very often warped mats. Mats received in a



warped condition from outside sources can be straightened in most cases by placing them in the Reliable Scorcher.

The Printers Mat Paper Supply Co., 559 West Lake Street, Chicago, Ill., is manufacturing the Reliable Dry Mat Scorcher, which has a drying surface measuring 11 by 17 inches. A mat of maximum size or a number of small mats can be dried in less than a minute. The scorcher cover is so arranged that steam can escape and is of proper weight and rigidity to insure the forming of a flat mat. The source of heat may be either gas or electricity and suitable units can be furnished as desired.

Hulse Recovering

The many friends of Edward Pierce Hulse, consulting editor of PRINTING EQUIPMENT ENGINEER, will be pleased to learn that he is well on the road to recovery after a somewhat protracted illness and that contributions will again appear in early issues of this magazine.

Wisconsin Executives Meet

The Wisconsin Newspaper Composing Room Executives' Association meet will be held at Fond du Lac, Wis., on the 15th and 16th of June. Officers of the Association are: O. A. Winrich, president; Henry Smits, vice president, and M. E. Cartier, secretary-treasurer.

In a Mat . . .

=It's Printing Quality

The fidelity with which the various forms as set up in the composing room are reproduced and converted into curved plates as required in the press room is just as vital as the number of casts. In other words, the problem in the stereotype foundry is twofold; one of quality and quantity.

■

In hundreds of newspaper plants Certified Dry Mats are meeting and solving this twofold stereotype problem to the entire satisfaction of their stereotypers and publishers. Where they use Certified Dry Mats they know that they can depend upon them for the production of good printing plates day in and day out.

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We respectfully invite you to try a case of Certfied Dry Mats in your own plant, under your own working conditions.

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Forget price! Use quality at the right price! It pays!

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For dependable stereotyping—use Certified Dry Mats

Made in U. S. A.

DIRECT PRESSURE MOLDING

LET'S HEAR FROM YOU!

★

A soft mat is the chief requisite for this type of molding—one that will take what you've got, hold it, and in turn give you clean, smooth plates. FLEXIDEAL dry mats will do the trick in your shop—they are widely used for this type of work. Give them a trial and see for yourselves.

P. S.—Our molding and drying felt, especially designed for direct pressure molding (not to mention wet mat work also) is used in at least 75% of the shops molding and drying under pressure.

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★ SAMPLES ARE YOURS FOR THE ASKING

The Deep-Etch Offset-Plate Process

By MAX REICHEL*

LITHOGRAPHY has seen some new ideas since the offset press was introduced in 1906. Printing from a rubber blanket made offset lithography one of the finest printing processes on account of its details and velvet tones. Speed, which offset-press builders increased from time to time, also helped in increasing the demand for this kind of work.

When lithographers brought the camera into use, the 10 and 12-color jobs were reduced to 8 and 6 colors, because screen work made it possible to reproduce with closer fidelity to the sketch. Finer tones and better blending of colors were obtained, so that medium-tone colors were dropped completely and the printing of fewer colors took place.

After the multicolor offset press was put on the market, it became feasible for the lithographers to run jobs on these presses that were previously done by letterpress printers.

Quite a few printing houses started offset departments to retain their trade, running certain kinds of work on offset presses.

Today lithographers, and especially printers, ask the question: What is the life of an offset-press plate and how many impressions can be run off from such a plate? This question also comes from newspaper printers and publishers of magazines and catalogues.

The Bekk and Kaulen offset deep-etch plate can answer this question. This new process, which is the ingenious work of Doctor Bekk, of Berlin, took 10 years of hard labor to obtain the results that are today shown by establishments that are the users of this deep-etch offset process. Newspaper houses in Europe print their weekly supplements from offset deep-etched plates from a web offset press, running as high as 250,000 impressions from one plate, obtaining a speed as high as 10,000 cylinder revolutions per hour, producing 20,000 copies per hour.

The deep-etched plate has quite a few advantages over the old planographic plate.

By etching the image below the surface of the plate a perfect reproduction of gradation of tones is created, which means that from a fine pin-point tone to a 50-50 or three-quarter tone the dot formation is kept to its original size from the first sheet to the last.

By carrying more ink on the roller perfect solids can be obtained without injuring the tone valuation, and

*New York, N. Y. Abstract of paper delivered at the second conference of technical experts, Washington, D. C.

on account of there being less water on the plate, which is another feature of the process, the result is more brilliancy of colors and better register.

Durability of a plate can be secured on account of having the image of the work etched below the surface. Friction of cylinders cannot spread or injure the dot; hence the statement, as made before, that the life of a plate can be prolonged from 200,000 to 300,000 impressions and over. This, of course, depends on the skill of the pressman.

The deep-etch plate has another advantage over the albumin plate, and this is in the matter of humidity. The dampness of the air does not penetrate our glue solution; therefore, one can coat as many plates as he judges he would need for the next two or three weeks and store them in a place which is safe from any daylight or strong artificial light.

The process can be worked in any concern without a big additional cost. The equipment consists of an etching trough, a heating cabinet, and a tray for a soda bath. A plate whirler (75 revolutions per minute) is also necessary.

The making of a deep-etch plate is simple, because temperature and specific weight control are standardized to a very fine degree. The chemicals are four special standards.

For a printing-down medium a positive is used, which is reading left. This positive is brought in contact with a press plate which is coated with a special bichromate-glue solution. The print can be made either by a vacuum frame or in a photocomposing machine. After the exposure is made the printed plate is then coated with a special varnish and developed in the etching trough by water. The exposed parts are hardened and acid resisting, and the unexposed parts are washed out by water. After the plate is dried in the whirler it is ready for etching, which takes only one minute. The depth of the etched image gages from 0.0005 to 0.001 of an inch. The etched portion of the plate is now treated with special reversing ink, and then dried in the heating cabinet. The plate is then cleaned of all glue and varnishes, a soda bath taking care of this. After the plate is removed from the soda bath it is rinsed thoroughly under water and etched with an etching salt, and then gummed.

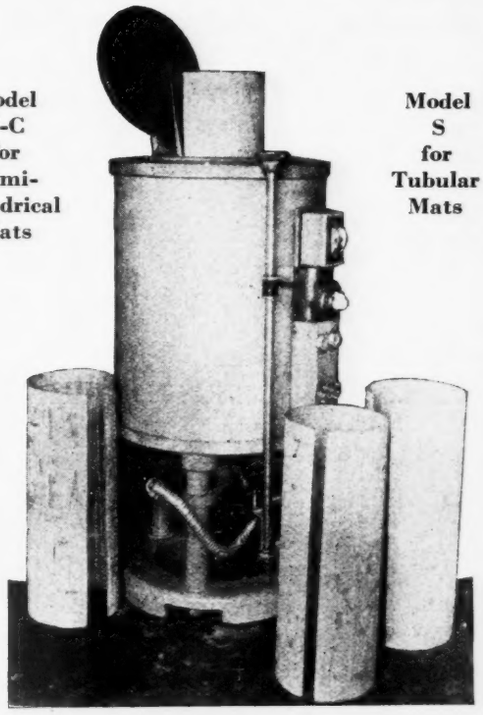
Now the plate is ready for the press. The pressman does not need to change any operation on the press and can go right ahead in the usual procedure.

The positive retouch process, which will make it possible to etch a positive on glass or film, will simplify the making of color plates immensely and will cut out two camera operations, provided the press plates are made from positives.

Collectively speaking, the lithographic industry will experience in the very near future some very interesting changes, such as etched glass or film positives in connection with deep-etched press plates run on 1-color or multicolor, sheet fed or web offset presses.

FORM-O-SCORCH
Centrifugal Matrix Scorcher

Model S-C for Semi-Cylindrical Mats



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MODEL S MACHINE

The new Form-O-Scorch Precision Dry Mat Former and Scorcher is the product of experts and engineers in the newspaper field.

This machine is FAST as it SCORCHES and FORMS under centrifugal force with a BLAST of hot air circulating on BOTH SIDES of THE MAT.

Buckles, Cups and Concaves are removed from any make of matrices instantly and scorched at any degree of heat you desire.

England, Germany and France acknowledge this type of machine to be far superior to all others and is in general use all over Europe.

Consult us at once and we will show you how to save time and money with perfect results.

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Any Printing Press Mfg. Co.

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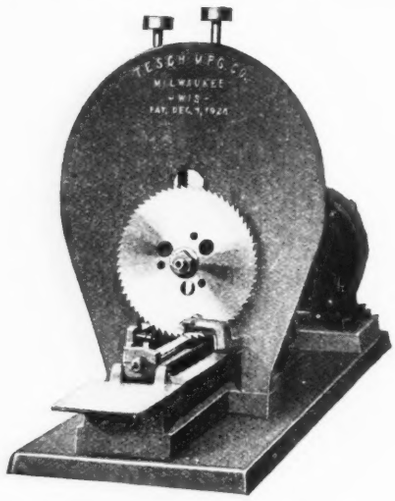
CAN AFFORD

this Automatic Saw Filer



In times like these every composing room is looking for ways and means of keeping down costs. A good automatic saw filer is an economy every composing room should have.

***The* TESCH AUTOMATIC SAW FILER**

— is priced low. Its economies are so many that the Filer soon pays for itself. It saves time, delays, spoilage and sharpening expense. The Tesch Automatic Saw Filer can be had in hand power or motor driven types. It is fully automatic, only two simple adjustments, adjustable as to angle and pitch, and built to give a lifetime of service. It is guaranteed to be of high grade materials and workmanship, any defective part will be replaced free of charge within a period of one year.

You need an Automatic Saw Filer — *it's a worth while economy* — send the coupon below and let us give you complete information, including prices on the Tesch Automatic Saw Filer.

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419 North 27th St., Milwaukee, Wisconsin.
Gentlemen:—
Without obligation please send me complete information and prices on the Tesch Automatic Saw Filer.

Firm Name _____

Attention of _____

Address _____

City _____ State _____

Chas. P. Howard --- Labor Leader

Continued from page 11

Federation definitely declare for a constructive and progressive policy for American labor. At the Portland convention of the Federation he was named chairman of the Committee on Shorter Workday, being one of the few delegates not a vice-president of the Federation to be accorded the honor of committee chairmanship.

After serving the International Union as first vice-president from November 1, 1922, until June 16, 1923, he succeeded to the presidency at the death of the late President McParland. Much was accomplished to return the Union to conditions of peace after the 44-hour strike.

During his administration the International Union made great progress. The finances of the organization were rehabilitated; scales were established at the high levels; strike assessments were discontinued, and at the close of his administration the Union was in a strong financial position.

In presiding over the conventions at Atlanta, Toronto, Indianapolis, Charleston, Seattle and Houston, Mr. Howard won the praise of even his political opponents by his fairness and practice of democratic ideals. His experience in many important lines of endeavor during the past twenty years, and his period of service as President of the International Typographical Union especially fitted him to render service to the members of the Union who believe the Constitution of the organization should be observed by officials and members alike; and those who adhere to the belief that aggressive trade union policies will bring to the working members of the organization the fullest measure of recognition in the matter of wages, hours and conditions.

Mr. Howard was elected President of the International Typographical Union in May, 1926, and was re-elected in May, 1928. In the general election in 1930, for the first time in the history of the International Typographical Union, there were three candidates for International President. At this time President Howard was returned to office by a majority of 10,561 over the combined vote of his two opponents.

Under President Howard's administration wages have been increased and the membership of the International Typographical Union has been increased. Much progress has been made in reducing hours and preparing for the five-day week. President Howard has been very much interested in the unemployment condition and his advocacy of the adoption of the five-day week has been the means of employers giving favorable consideration to the idea.

The logical place to advertise printing equipment and supplies is in PRINTING EQUIPMENT ENGINEER— where it will be read by 6,000 mechanical executive buyers.

New Catalogs, Books and Bulletins

Readers of PRINTING EQUIPMENT ENGINEER who are interested in securing any of the catalogs, books or bulletins listed below can do so by checking the literature desired. Mark carefully only that literature which you wish to receive. Fill out the coupon, tear out the page and send it to us. The literature will be forwarded without cost.

Tesch Automatic Saw Filer—A circular, 8½x11 inches, illustrating and describing an automatic saw-sharpening mechanism, designed to file all circular saws, including the smallest linotype trimmer, engraving, stereotype and woodworking saws up to 10 inches in diameter.

Jiffy Metal Furniture Mold—A 4-page illustrated circular describing a small device to make metal furniture in the composing room, 20x25 ems, which can be later cut up into various sizes on a saw-trimmer from 3x3 ems up to maximum size of 20x25 ems.

Waters' Assembler Slide Return Spring and Vise Jaw Lock—Designed for application to Linotypes. Two circulars illustrating and describing devices for application to outstanding machines.

United American Heavy Stuff—A 22-page-and-cover, 4x9-inch publication, the contents of which are devoted mainly to type and stereotype metals. Miscellaneous entertaining matter fills the balance of the pages.

The Chuck Problem Solved—A folder demonstrating the utility and economies to be derived from the use of Oneida Chucks for use with spiral or straight wound paper winding cores. The chuck is made and distributed by John Waldron Corporation.

Tempo Light and Bold—A 5½x8⅝-inch, 16-page booklet done in colors on white stock demonstrating composition possibilities of Tempo Light and Bold type faces, the matrices for which are made by the Ludlow Typograph Co.

Catalog of Parts—Four sample pages from a catalog of parts for application to Linotype machines, to be published by Rich & McLean. Each part is illustrated by a line drawing and key number.

Cemer Electric Matrix Scorcher—A 12-page illustrated folder, describing the forming and scorching of stereotype matrices in one operation and explaining how the scorcher accommodates two mats at a time which doubles the average production.

Special Tools and Appliances—A catalog, 3¾x6¾, 104 pages and cover, many illustration. Magazine racks, gauges, tools and machine parts for linotypes and intertypes are described. Wm. Reid & Co.

Make Stereotype Mats of Your Standing Forms—A small 8-page illustrated folder describing the Reliable Mat Molding Press, Scorcher and Humidor.

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Possibly no other organization but Burgess—with its research engineers, ample facilities, modern equipment and resources—could have produced "Chrome" Mats. It is a typical Burgess achievement that is benefitting a great many newspapers and commercial shops.

This Burgess product has proven a revelation to the practical and experienced men in the stereotype rooms. The results secured by its use has surpassed all expectations—definitely proving that it gives better printing.

If you are not using Burgess "Chrome" mats you are invited to write for samples.

It will pay you to do so, for if these mats can give you better results . . . and the experience of several hundred publishers, printers and advertisers proves that they will . . . they are the mats that you should be using now.

Won't you write . . . today . . . for samples?

As a further convenience and service to our customers, we are in a position to take care of your requirements for Stereotype Department Accessories of all kinds.

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Wood Service Men Are "Experienced Help"

WOOD Service Men are important contributors to Wood experience and research. They know their field intimately, because they have had practical experience as stereotypers, and because from the time they became Wood representatives, they have been in daily contact with the stereo departments of the country's newspapers.

The experience of these men in the field, the production experience represented by the Wood mill and the knowledge gained from experiments and tests in our research department, all combine in the final production of our one product—the Wood Dry Mat.

Let the Wood Service Man who covers your territory, discuss your problems with you. There will be no obligation, but there will very likely be some productive suggestions for your plant.

WOOD

FLONG CORPORATION
HOOSICK FALLS, N.Y.

Air-Conditioning

Continued from page 12

IMPORTANCE OF TEMPERATURE CONTROL

The control of temperature, while perhaps not so obviously necessary as the control of humidity, is nevertheless of considerable importance to the printing industry. This is particularly true on the low side. If temperatures in a pressroom are allowed to drop below 75° F. (the present writers believe 78° F.), the tack of ink is increased, the flow slowed, rollers become stiff, and poor distribution results. This is especially noticeable over holidays and week ends. If temperature has been allowed to drop, it frequently takes several hours on Monday mornings before the large amount of metal in the machines can be heated up sufficiently to permit running. The mechanical circulation of warmed air appreciably reduces this warming-up period. An important aspect of air distribution and temperature control is also the even distribution of heat so that one portion of the plant may be adequately heated without overheating other portions. The same applies in establishing uniform conditions of humidity in a given area.

LIMITATIONS OF HIGH TEMPERATURES

The limitation of high temperatures in the general commercial plant is of less importance in its mechanical effect upon printing operations than the accurate control of humidity. However, care must be taken that the design of the system does not necessitate inhumanly high temperatures (above 90° F.) in order to secure constant humidity where refrigeration is not used, and special consideration must be given to such portions of the plant as monotype caster rooms, stereotype and electrotype foundries, and photographic galleries, where excessive amounts of heat are generated, to carry this heat away and produce relatively comfortable working conditions.

SPECIAL DEPARTMENTAL CONTROL

In certain special departments the control of maximum temperatures is of importance. In the sensitizing and etching departments of rotogravure plants temperatures should not be allowed to exceed 75° F. The control of maximum temperatures is also indicated in photolitho-plate-making departments.

IMPORTANCE OF RELATIVE HUMIDITY

The control of relative humidity, that is, its maintenance at a constant point, is of the greatest importance, as we have already discussed. This involves the addition of moisture to the air when it is deficient and the reduction of the relative humidity when it becomes too high. This latter process may be accomplished, first, by true dehumidification, that is, the removal of the moisture from the air by chilling it below its dew point; or secondly, by heating it to a point where its relative humidity is reduced to the required point.

The first of these methods, while rather more expensive, gives control both of humidity and temperature and permits lower humidities to be carried in summer. It would be indicated in such places as photolitho plants, where relative humidities of 50 per cent and control of maximum temperatures are desirable.

For the commercial letterpress plant the maintenance of a fixed humidity by automatically shifting dry-bulb temperature is economical and entirely practical. While it is true that this method of control at times of high outside wet bulb leads to somewhat uncomfortable working conditions, its first cost is so appreciably below that of a complete dehumidifying system as to warrant careful consideration. And inasmuch as a fixed relative humidity is the outstanding requirement of the letterpress plant, such a system will go far toward correcting the difficulties above outlined.

DEHUMIDIFICATION

In many cases it has been found possible to accomplish dehumidification without the installation of refrigerating equipment by the use of an already available supply of well water, either from a well or, in certain localities, by using the city water supply. The possibilities of such a source of cold water being available should be investigated on each individual job. In general, quantities of water of from 200 grams per minute up at temperatures of 55° F. or lower will be required.

DISTRIBUTION OF CONDITIONED AIR

The question of air movement, or the distribution of conditioned air throughout the plant, is one of rather more vital interest in air conditioning for the printing industry than in some other types of industrial applications, and it is one that is sometimes apt to be neglected, although it is axiomatic that no air-conditioning system is better than its distribution. In a printing plant care must be taken to secure uniformity of conditions throughout the plant, to distribute the air in accordance with the heat load, and to use air velocities and locate duct outlets in such positions that drafts are avoided, both where stock might be distributed or personnel made uncomfortable. There are a number of special departments, such as foundries and machine composing rooms, where special types of distribution must be used in connection with exhaust systems to handle the large amounts of air required, and others, such as large web presses, which require special treatment in order to avoid "dead spots."

CLEANLINESS OF THE AIR

Cleanliness of the air circulated is also of importance in printing-plant work, where floating dust settling upon forms, rollers, wet plates, and films is the cause of distressing stoppages and spoiled work. All outside air should be thoroughly cleaned before being brought into the plant, and if there are unusual amounts of impurities outside, such as soot, we must resort to special cleaning procedures. Similarly the dirt

The NEW improved Superspeed Scorcher

Before you buy any Scorcher you will do well to get complete information on the efficiency and economy of the new Superspeed Curved Scorcher "Model SS-3." This Scorcher is in widespread use from coast to coast. It has a national reputation for speed, accuracy, simplicity, and economy. Every machine fully guaranteed.

Write today for complete information on the use of the new Speed Products' Metal Conveying System for pumping metal from the press room back to the stereotype department.

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Automatic Metal Feeders
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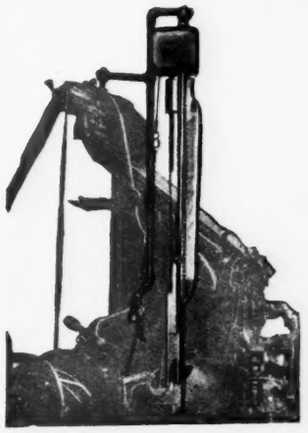

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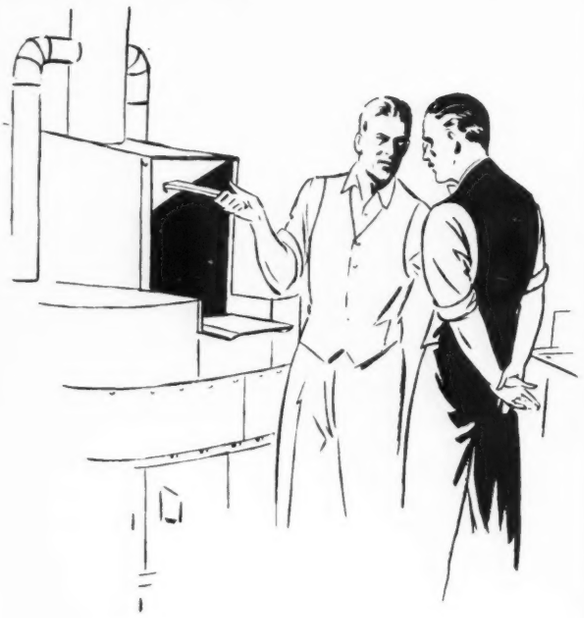
HERMAN DIAMOND, President
213 CENTRE STREET NEW YORK CITY



"Now Here is Why You Get Less Dross With Imperial . . .

"See the small amount of dross on that metal. Well here's why. The lead, tin, and antimony in Imperial Metal are in 100% solution with one another, resulting in a perfect mixture. This fact enables Imperial Type Metal to be cast at the lowest possible temperature and, of course, you know that the lower the temperature the less the dross. As a result of this low temperature you have less fuel expense and less dross. This is just one of the many ways in which Imperial Metal and the Plus Plan reduce type metal costs. It will pay you to

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produced inside the plant must be removed from the air, and where such impurities as bronze, graphite, and the carbon dust of photographic arcs are encountered, provision must be made to prevent their return through the distributing system. A microscopic and bacteriological analysis of the impurities washed from the air of a printing plant will reveal the importance of this factor, both from an operating and hygienic standpoint.

Finally a complete and properly designed air-conditioning system should provide ventilation, that is, should positively bring in to the plant sufficient outside air to make up for that vitiated by people, gas burners, and other factors, to carry away fumes and maintain a slight positive pressure on the building.

FLEXIBILITY OF AIR-CONDITIONING SYSTEMS

As stated above, these are the qualifications of a complete air-conditioning system. An individual printing plant may need all of them or only some of them. We may have a system which controls humidity but not temperature; a system which heats but does not cool; conceivably a system which cools but does not heat; or a system for ventilation but nothing more.

The determination of what system and how far it should go should be the duty of a competent air-conditioning engineer working in conjunction with the printing-plant manager, balancing requirements of the system against its economic value.

The Point System

Continued from page 14

12 points equal .166044 inch, and 72 points equal .996264 inch. The above basis has ever been our practice.

We are confident that if you write the American Type Founders Company you will find that their point has ever been .013837. The American Type Founders Company has written:

> The standard point of the American Type Founders Company is .013837 inch for both body and set-wise measurements. This was adopted many years ago, and we believe that it is the accepted standard of all the larger type foundries in this country and has been adopted by the larger foundries of England. Really, 72 points is .996264 instead of .996, the small fraction being dropped for convenience as it means so little to the ordinary reader.

VALUE "D"

This is used by the Linotype and Intertype companies for the body measurement of slugs. On this basis a 10-point slug should measure exactly .140 inch thick; a pica slug should be exactly .168 inch thick. The actual thickness of the slugs from any machine or battery is, of course, to a certain extent under the control of the machinist in charge.

DISCUSSION

The question may be asked, "What do these slight differences, in the fifth and sixth decimal places, amount to, if anything?" As they stand in the table, for a single point, they appear to be inconsequential. When multiplied across the width of a newspaper page, or across four pages in determining paper roll widths, they take on greater significance.

This is best illustrated by a concrete example. Consider a page of 8 columns, 12½ ems, with 6-point column rules. The 8 columns have a combined width of 100 picas; the rules add 3½ picas, making a total width of 103½ picas or 1,242 points.

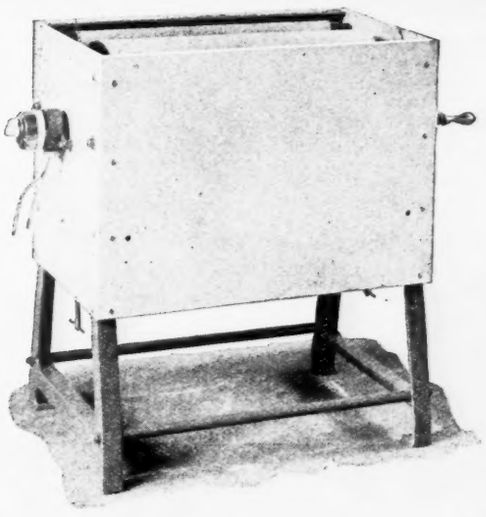
Using value "A" (72 points equal 1 inch) to calculate the type page width, we may either divide 103½ by 6 or divide 1,242 by 72. In either case the result is 17.25 inches. Using value "B"" (72 points equal .996 inch), the calculated width is 17.18 inches (more exactly 17.181). The difference between these two results is .07 inch which is more than 1/16 (about 1/14). Across four pages the difference amounts to .28 inch, or, expressed as a common fraction, 9/32 inch. Since slug-casting machines are in almost universal use by newspapers, the logical basis on which to calculate the width of a type page is value "A."

The pica em on the basis of value "A" measures exactly 1/6 inch, or .166-2/3. On the basis of value "B" it measures exactly .166. The difference on each pica is .000-2/3, or two-thirds of one thousandth of an inch.

Since column rules are manufactured according to a point whose value is either "B" or "C" (the difference between which may be disregarded here), it would be more strictly correct to calculate the total space occupied by column rules by using value "B." But to do so is not worth the trouble involved, because in 42 points or 3½ picas, the difference is only .002-1/3 inch. Therefore, for practical purposes the width of a newspaper type page may be calculated on the basis of 72 points to the inch.

The actual page width will be somewhat less than the calculated width because of the shrinkage of the metal on cooling. The Linotype Company states that this shrinkage on a 12-em slug, determined by measurement, varies from .004 to .008 inch, with an average value of .005 to .006 The actual shrinkage depends upon the composition of the metal and various other conditions. The Ludlow Company says, "There are slight variations in the shrinkage allowance applied to different shapes, but in general this approximates .00005 inch per point." This agrees substantially with the Linotype Company's statement.

That the differences between the various values of the point are of more than academic interest is further evidenced by the following statement from H. B. Rouse & Company: "In your letter you touched on a problem which is bothering every manufacturer in this country. There should be no variation in the decimal value of the printer's point."



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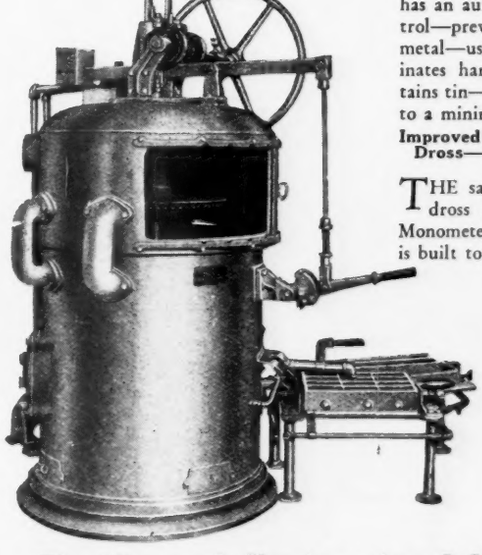

THE Monometer is scientifically constructed. It has an automatic heat control—prevents burning of metal—uses less gas—eliminates harmful fumes—retains tin—and reduces dross to a minimum.

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MOUTHPIECE VENT SLOTS

G. B. complains that he doesn't seem to be able to obtain a solid slug. The Linotype upon which he works is used mostly for 6 point, 15-em, and 10 point, 20-em composition. He states that the metal is of proper analysis, metal temperature is all right, the plunger is cleaned daily and fits nicely in the pot crucible well; the vent sprues are about ¾ inch in length and the mouthpiece jets are clear. It seems that metal tends to fill the vent slots in the mouthpiece. The trouble occurs mostly after the mouthpiece has been faced.

Answer.—Probably the trouble is caused by the metal which clogs the vent slots in the mouthpiece. After the mouthpiece has been faced, it may be that some wire edges are caused to appear along the sides of the vent slots, since the stone used for facing purposes is stroked parallel with the mouthpiece and crosswise with the slots. It is a good idea to clean out the vent slots with a three-cornered hardened steel tool, using heavy downward strokes. Follow this by shaping a hardwood stick and use it to polish the slots, applying a little Dixon's mold polish. The steel scraper mentioned above can be made by grinding a three-square file so it will have sharp corners. A special tool for this purpose has recently been placed upon the market.

MATRICES "SQUABBLE" ON WAITING LINE

T. S., who operates an Intertype, asks if there is any way in which he can prevent matrices "squabbling" at the left side of a waiting line in the delivery channel.

Answer.—See that the delivery slide long finger block friction is operating properly. The friction should retard movement of the long finger until the matrix line bears against it as the delivery slide is traveling from normal to waiting-line position in the delivery channel; secondly, when changing measures, set the delivery slide long finger as closely as possible to the assembler slide finger; thirdly, space out each line as fully as possible. It is not an earmark of a careful operator to send in 14-em lines requiring 3 ems of justification, even though there are enough spacebands to justify the lines tightly.

KNIFE WIPER TROUBLE

O. M. requests information which will enable him to eliminate trouble he is having with a knife wiper. The wiper does not remove fine metallic shavings from the side knives. The shavings cling to the type face on the slugs.

Answer.—Remove the knife wiper rod from the vise and put enough "dog leg" bend in its just above the link screw hole so that when the rod is at its extreme upward stroke the bow in the rod will nearly touch the rod guide cap, but not binding against it. It would also seem that you have adjusted the left-hand knife too much toward the right so the knife scrapes the constant side of the slug. These fine shavings hang along the edges and curl inwardly. The next slug will carry some of the shavings with it through the knives. The left knife should be adjusted to trim the draw at the top of the slug sufficiently to secure square trim, but should not scrape any metal from the smooth side of the slug.

THE quality of the type produced by your machines is controlled directly by the quality of the metal in the machine pot.

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Don't neglect your metal. « Keep it in perfect working condition at all times. » Let us help you do this « use our laboratory service. « We will gladly make a chemical analysis of samples submitted by any printer or publisher and render a complete and impartial report.

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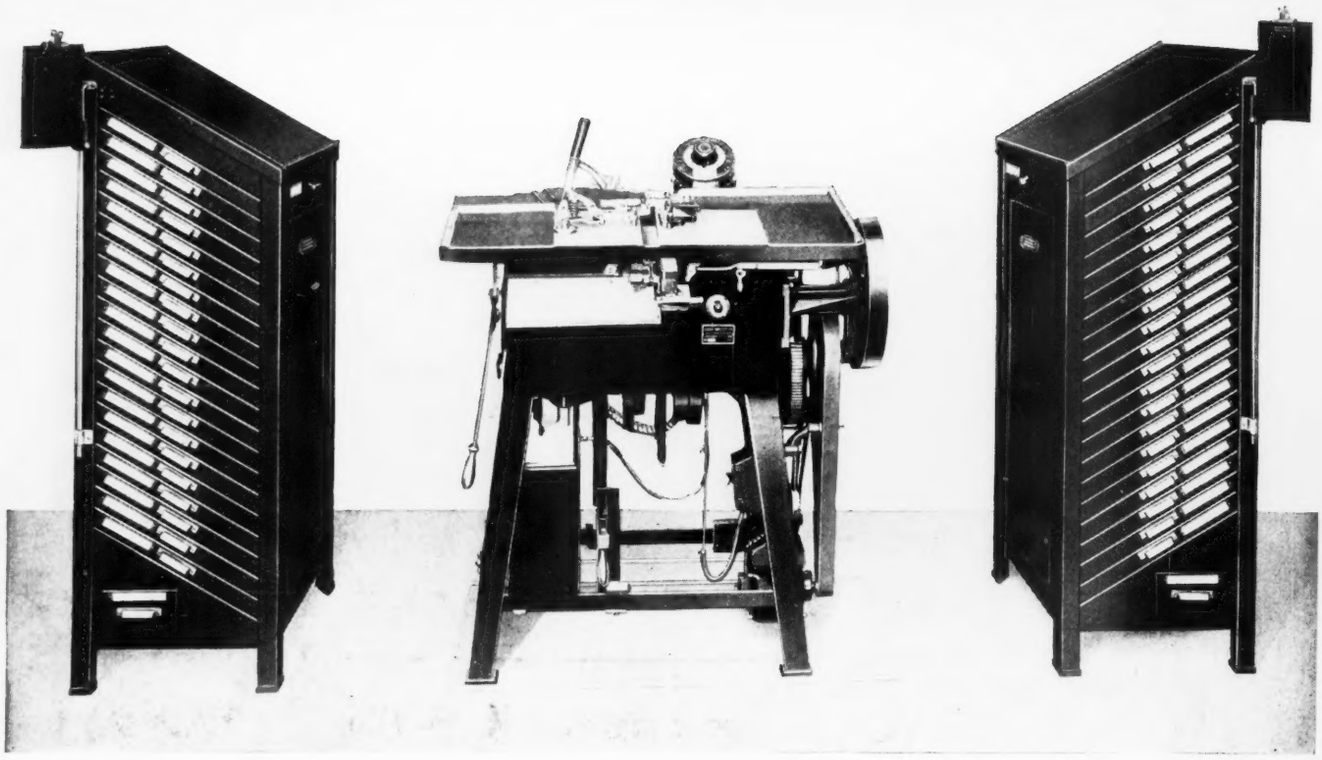

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Keyboard line-casting machines were a godsend to the printer setting straight matter. The Ludlow has extended the matrix and line-casting principle over the whole range of sizes from 6 to 72 point.

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Freedom from all limitations of type supply, making possible the handling of any job at any time, would represent the fulfillment of many a printer's dream. The Ludlow provides just this facility. The advantages of all-slug make-up on the stone and press require no argument. Only the Ludlow makes this possible.

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